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BOSTON UNIVERSITY

GRADUATE SCHOOL

Thesis

PHYSICAL AND MENTAL GROWTH IN RELATION TO
MORAL AND RELIGIOUS EDUCATION

Submitted by

Kenneth Lewis Heaton

(A.B., Indiana University, 1924)

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I. A THEORY OF EDUCATION.

A. General Laws of Thought.

Many attempts have been made to formulate a psychological theory of education. Not because it is accepted universally but because it will at least give a working basis for the more definite discussion to which this thesis is devoted, we will consider the theory of J. C. M. Garnett.¹

A theory of education must be based upon the functioning of the human mind. Garnett discusses the subject from the standpoint of the neurology of mental processes, organizing the learning process on the basis of five laws of thought. According to the first of these, "A nervous impulse traverses the neurones of one or more sensory regions of the brain whenever any mental process occurs."² This means, simply, that accompanying each mental process, conscious or unconscious, a corresponding physical process takes place in the neural paths which lead from one brain or lower cortical center to another.

These neurones do not function separately but are bound together into many complicated systems. Each time a nervous impulse passes from one neurone to another, the resistance of the synapse or connection is reduced. Thus there develop various systems of neurones or neurograms which have become closely linked together by the frequent passing of impulses from one to the other. According to the second law of thought, "Excitement in any nervous arc tends to spread to every other arc that is connected with the first through synapses, the insulation of which the excitement in question is intense enough to overcome."³

Nervous impulses are continually entering the cortical centers from all sensory tracts. For a while the energy may be diffused over several paths, and then by association they may all lead back to reinforce a single central idea. In any individual, some one system may become habitually the path or

¹Garnett, J.C.M. Education and World Citizenship.

²Ibid, p.65.

³Ibid, p.289.

lowest resistance. A major impulse -- or an idea -- will tend to drain towards this one dominant system. "Any nervous arc of the higher level, if intensely excited relatively to other higher level arcs, tends to drain the impulses from those other arcs."¹ An arc is made particularly strong by the stimulation of a sensory end organ, presentation of a situation tending to call forth an instinctive response, the multiple stimulation from several sources, or by becoming connected with some related interest system. This last fact, which simply means that we tend to think of things that interest us, is of especial importance in relation to our subject and will be mentioned in a later part of the discussion. The will, also, "can reinforce the excitement in any excited system of higher level arcs; and so may cause that system to drain the excitement from all other active arcs of the higher level."²

There are purpose neurograms. In respect to their formation, they are of two types. There are those which for a time occupied the focus of attention and were merely approved. Others are accompanied by a more definite act of will. They may, also, be either positive or negative purposes; that is, they may be purposes to do or purposes not to do something. All these purpose neurograms, however, are included in what Garnett calls "one's future interest systems." These future interest systems are especially effective in determining both thought and conduct because they are associated directly with the thought-activities which precede and determine action.

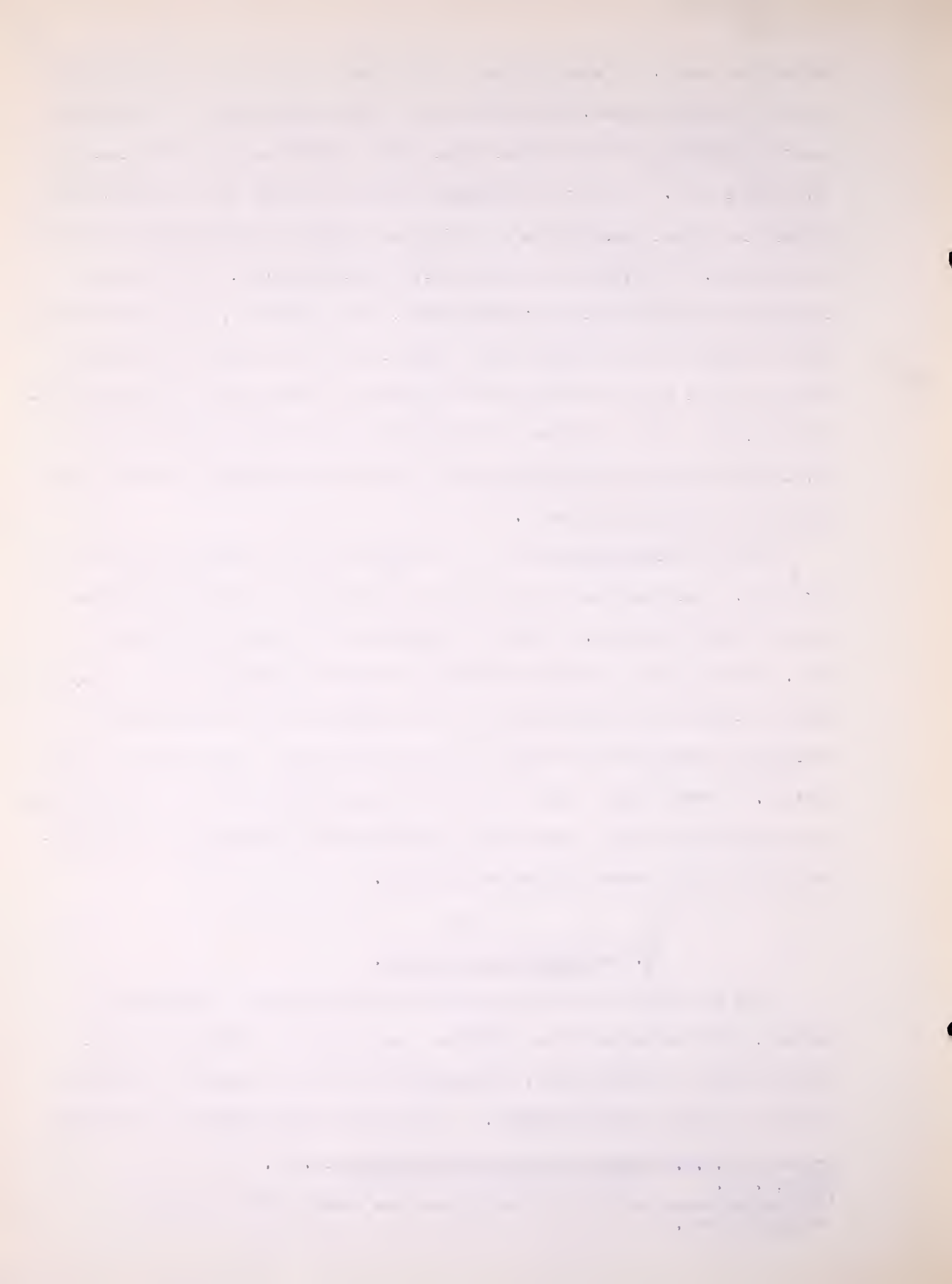
B. The Organization of Life.

Since the various interest systems are very important in determining conduct, there is trouble when they come into conflict. Although we try to harmonize them in various ways, integration³ is the only permanent and satisfactory settlement of any conflict. It is brought about usually by the will

¹Garnett, J.C.M., Education and World Citizenship, p.285.

²Ibid, p.285.

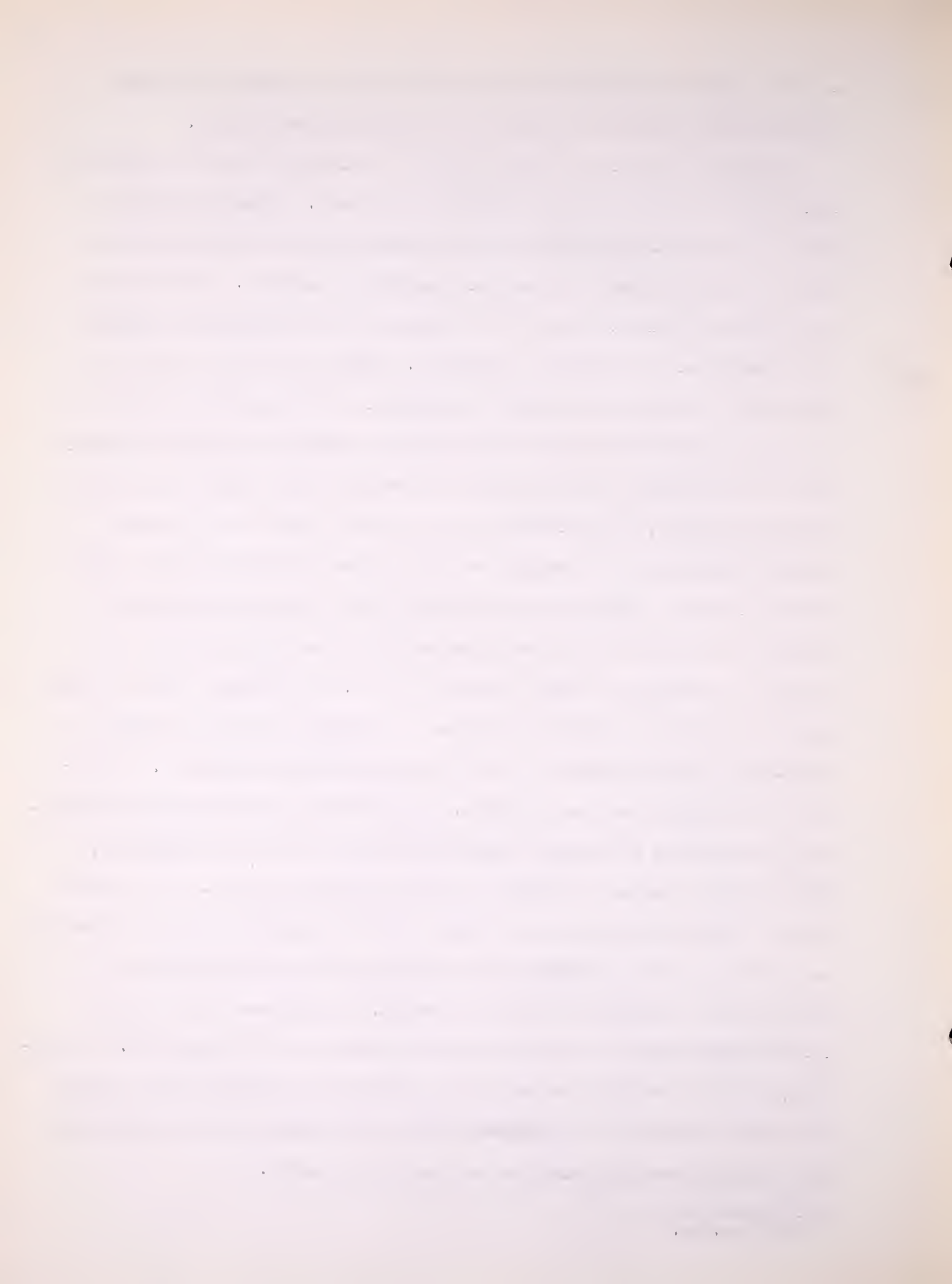
³The mental combination of different psychical elements into a single complex object.



or some unusual experience reinforcing one side of the conflict and thus bringing about harmony on the basis of a broader interest system.

Conflicts of interest systems within the individual mind or of different individuals are probably due to incomplete knowledge. Scientists believe that if we knew all facts they would fit together into a complete and harmonious whole which may be called the "endarchy of science". Since none of us can know all things, we try to fit together a little individual endarchy which harmonizes the available information. Since each one as a child is taught what the most of us believe is a part of the whole, since we instinctively try to relate known facts to the whole of reality, and since we usually adopt the discoveries of authorities in those particular fields with which we are not acquainted, the tendency of the individual endarchy is to become organized according to the maximal endarchy or the sum total of truth. The results of such an organization are various: (1) It assures more reliable reasoning to be able to test one neurogram by another, for, after all, consistency is probably our best criterion of truth. (2) It makes it possible for various individuals in society to agree. (3) Conflicts are not so likely to occur. They could not occur at all if the organization were correct. (4) Conduct is more consistent and effective. (5) It is more economical and efficient. (6) The resistance of the path from one neurogram to another is decreased, giving greater freedom of movement for both thought and action. (7) "Whoever has his thought so organized will tend to have more nervous energy available for all his thought; for, whatever may be the group of his neurograms that is excited during a particular train of thought, the excitement will tend to spread inwards towards the deepest central elements of his neurography."¹ Therefore, the aim of education should be the formation of individual organizations of thought about such life purposes or single wide interests as will harmonize with those of one's neighbors and the sum total of truth.

¹ Garnett, p. 225.



Since, according to the fifth law, action of some kind (i.e., movement or innibition of movement) is the normal result of every train of thought, and we tend to act in harmony with our interests and purposes; a society of inuividuals whose thought processes are harmonious will move forward, and move forward with the assurance of concentrated effort, towards the actual realization of the common life purpose. As Garnett states, "Every member of the ideal community or commonwealth should therefore possess a strong character, which means a strong will in combination with a single wide interest."¹

Such an interest becomes a philosophy or a religion. "So all members of a community whose conduct is so mutually consistent and effective as possible, and who therefore possess single wide interests centered in mutually harmonious purposes, must, in the first place, be religious."² This religion is largely a matter of will, which includes faith, which is the force which organizes all life about the center of interest. Since our purposes are not completely realized during our lifetime, this interest must involve hope or belief in something beyond this life, in the ultimate conservation of values. Otherwise, we would lose hope and all stimulus to continuous striving. Also, it is necessary that the religion shall lead the individual to be willing to cooperate to the extent of self sacrifice in order that society may attain its central purpose. The ideal character, therefore, "implies religion, faith, hope, and, most important of all, love for one's neighbour as the prime mover towards the fulfilment of one's central purpose."³

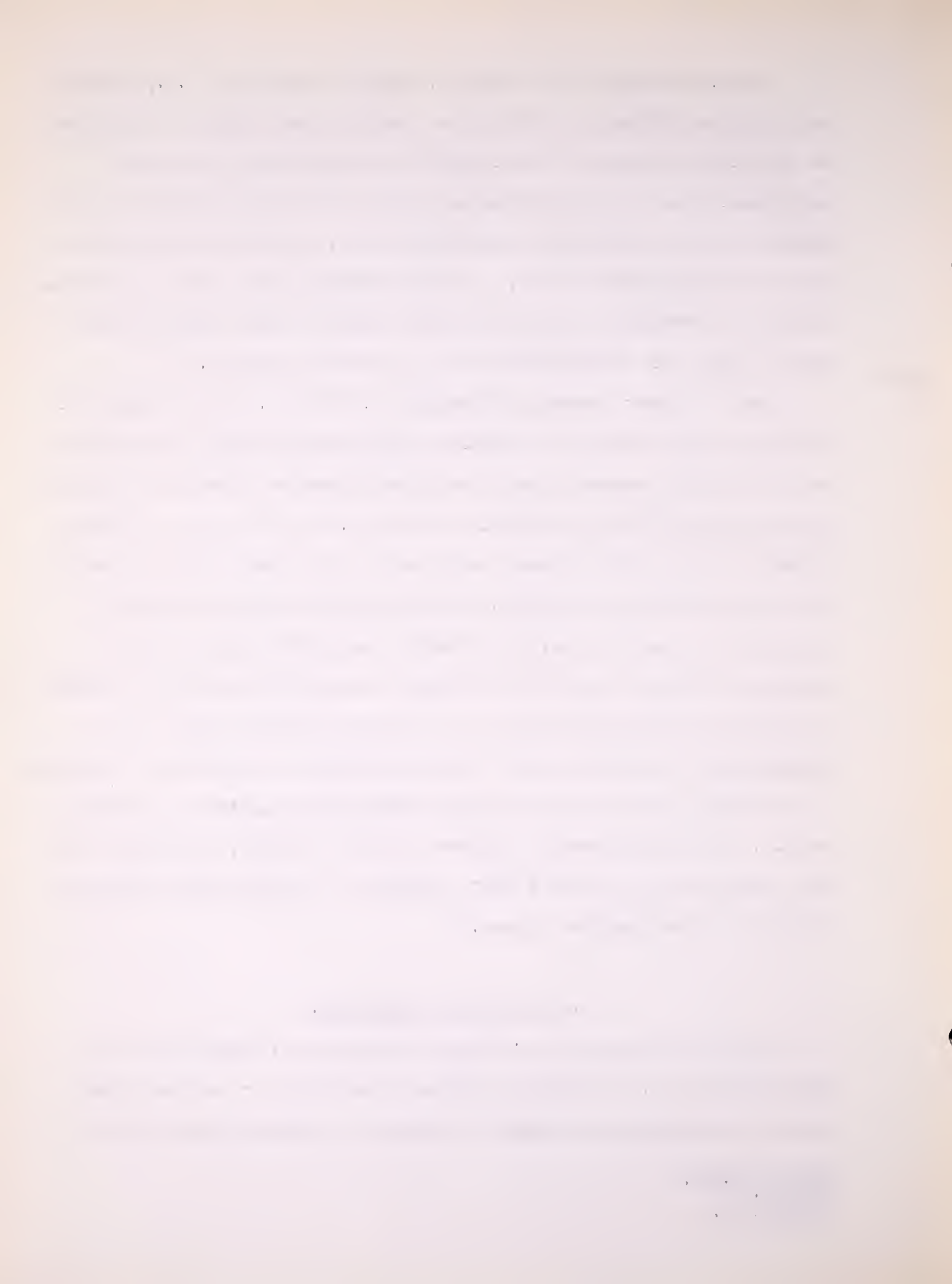
C. The Christian Hypothesis.

In the closing pages of his theoretical discussion, Garnett goes on to say that "In short, the Christian account of the universe -- or, as we may term it, the Christian philosophy -- completes the discovered part of the

¹Garnett, p.294.

²Ibid, p.296

³Ibid, p.303.



endarchy of science with a hypothesis concerning the hitherto undiscovered central essences;¹ and it does so, as we are about to observe, in a manner that enables the corresponding neurography to fulfil the conditions that have to be satisfied by the neurography of the typical citizen of a maximally efficient and progressive community."² He goes on to say that the Christian hypothesis most nearly satisfies the demands of an endarchy of science for the following reasons: (1) Because the Christian conception of God has a similar relation to the rest of the universe as that of the central essences of the endarchy of science to all the rest. (2) Christianity demands that every man's thought and conduct be centered around allegiance to God and to the conception of the ideal society or the kingdom of God. This corresponds to the demand of the endarchy of science that the neurography of the individual shall be in harmony with the progress of the commonwealth towards its central purpose. (3) It is necessary that someone shall have a very close relationship, and that all shall have as close a relationship as possible, with the central essence of the endarchy of science. Likewise, Jesus called men to that peculiarly close relationship to God, that of the son to the father. (4) Just as faith is necessary to the consistent, progressive movement of society, so is Christian faith deemed essential to the attainment of fellowship with God, both now and throughout eternity. This faith is active, explorative, progressive. (5) Both our conception of the essential character of the typical citizen of an ideal commonwealth and of the Christian character include hope in something beyond earthly life, some conservation and ultimate triumph of the good. (6) Christianity recognizes the necessity of brotherly love, in fact it gives it the central place in its philosophy of human relations. Thus, as he sought to describe what he calls the "endarchy of science", Garnett came to see that "all these conditions are satisfied by the

¹Central fact elements.
²Garnett, p.306.

fundamental Christian hypothesis: that God is the center of the universe; the central fact of the endarchy of science; that knowledge of God begins by faith; that hope of eternal life belongs to people who seek to know God; that brotherly love is of the very essence of God; and that all human beings are in some peculiarly close relationship to God."¹

¹Garnett, p.314.

II. MENTAL GROWTH.

A. Theories of Growth.

As we pass from the general and rather theoretical consideration of the education process to a more detailed consideration of its nature in relation to our particular subject, let us formulate a few general principles that are at least suggested by Garnett's volume. Whatever may have been their underlying psychological theories or technical vocabulary, most psychologists have adopted similar principles of mental growth as related to religious education. In the first place, the whole education process is a process of mental growth or of the formation of neurograms or neural systems. As Tracy says, "The transition from infancy to maturity seems to consist on the intellectual side, in progress from an unorganized and unintegrated medley of impressions and images, to an organized and integrated system or totality; in short, a world, cognized as a significant unity."¹ In the second place, there is no great division between religion and morals or between the two and any other phase of life. Religion is an organizing principle for all life. "It is life itself improving itself."² Therefore, the goal of religious education for the individual, as should be the goal of all education, "is thus seen to be the completely socialized will, expressed in a life which is sharing increasingly in the knowledge and work of an eternal society, and in the joy of human and divine companionship -- in a word, world-citizenship. The goal of religious education for society is the reorganization of institutions and enterprises in such a way as to provide for all individuals the stimulus of the religious heritage of the race, and equal opportunities for health, education, work, play and worship -- in a word, world brotherhood."³ Since the purpose of this education process is the organization of thought and action around the central life purpose, it follows that at any particular time the

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²Garnett, p. 514.

³Hartsnorne, Hugh, Childhood and Character, p. 17.

Ibid., p. 6.

educability of any individual is limited by his potentiality or capacity for mental organization and by the apperceptive background or the material in the form of experience and already existing interest systems which may be used in the formation of a more complete endarchy or philosophy of life.

There have been two theories as to the method in which mentality develops. The first theory is that mental growth is periodical. This may be called the biological viewpoint because it has developed largely from the study of the periodicity of physical growth and the belief that the same characteristics must typify mental growth. Tyler says, "Every part has its own time for acceleration of growth. Care, attention, and proper exercise will at this time produce far greater and better results than before or afterward."¹ This theory he thought applied equally to physical and mental growth. These exponents of periodical growth think that feelings and emotions develop first, and last of all, beginning about the adolescent period, the ability to reason.

Reliable evidence seems to favor the other theory; that of simultaneous growth. After his study of "Changes of Mental Traits with Age", Brooks came to the conclusion that improvement in all mental functions was nearly constant and regular and that between the ages of nine and fourteen the annual percentage of gain is probably best represented by a straight line whose slope is probably slightly negative.² An experiment of F. C. Bonser with over 700 school children of the fourth, fifth and sixth grades, showed that reasoning ability did not appear suddenly, but that "for both boys and girls, there is progress from grade to grade, both in median ability and in the percentages reaching the highest quartile for all."³ The following summary tables of Bonser's results show the regularity of growth as he found it in his experiment:

¹Tyler, J. M., Growth and Education, p.63.

²Brooks, F.D., Changes in Mental Traits with Age.

³Bonser, F. C., The Reasoning Ability of Children, p.78.

Table XLIV -- Median Ability¹

Grade	Boys' Scores	Girls' Scores
4A	117.50	130.00
5B	155.62	145.25
5A	160.62	155.00
6B	187.00	165.50
6A	205.00	204.50

Percent of Each Grade Reaching the 75 Per Centile of All

Grade	4A	5B	5A	6B	6A
Boys	5.67	18.97	19.95	42.85	62.00
Girls	2.27	10.45	24.13	45.65	64.37

Baldwin says that "We can fix no absolute time in the history of the mind at which a certain mental function takes its rise. The observations, not quite extensively recorded, and sometimes quoted as showing that the first year, or the second year, etc., brings such and such developments, tend, on the contrary to show that such divisions do not hold in any strict sense.....Only in broad outline and by the widest generalization can such epochs be marked off at all."² Irving King says that "Even from the first the various processes are not marked off closely from one another. The entire child is essentially in every reaction, and it is only to the observer that he seems now in a state of emotion, now in one of cognition, etc."³

¹ Bonser, The Reasoning Ability of Children, p.74.

² Baldwin, J.M., Mental Development in the Child and the Race, p.10.

³ King, Irving, Psychology of Child Development, p.19.

B. Cross-sections of Growth Periods.

Although we agree that the child develops simultaneously in all phases of his mental life and there are few, if any, sudden changes which mark off the mental organization from age to age, we may still profit from dividing childhood into certain general periods. Even though these periods are purely hypothetical, they help us to organize our conception of the growth of the average child.

The first year of the child's life is spent in the struggle for the first adjustments to life. Imagine the baby with no background of experience trying to understand and adjust itself to the variety of new sensations which come to it. Since it has had no experience which gives it a basis for reason, it is necessary that the earliest forms of activity be reflex, impulsive and instinctive. Since the child has not learned what responses are valuable, it responds with its whole body to every sort of stimuli until it finds that it can conserve its effort by localized responses. Throughout the first year the infant is busied with many new sensations which gradually evolve from general confusion into a state of definiteness.

The next two years may be described as the period of acquiring independence. The child learns to talk, at least well enough to make adults understand what he wants and to understand what adults say to him. Independence is increased by the ability to crawl and later to walk. The imagination is active, especially in the play life. If the three year old does not have actual playmates, he gives names to trees and other objects. These playmates sometimes demand that he do things contrary to the will of adults and he may feel their demands to be more binding even than those of real people. The child is especially imitative at this period, and his imitation is more than mimicking. He imitates because he has an innate tendency to express himself in the same way as the adult, and not because he consciously tries to imitate the adult action. Sensitiveness to the desires and moods of others is possibly due in part to the fact that the

infant has not completely dissociated himself from others. By the age of three he is usually self-conscious enough to react in opposition to or in harmony with the will of others.

It seems that we are right in assuming that religious education begins at birth. Marshorne has suggested that in four respects the foundations of religion may be laid during the three years which we have called the period of infancy. From his first experiences the child may begin the development of a sense of order and justice, the formation of basic life habits, the development of a wholesome disposition of reverence and love through imitation of loving and reverent parents, and begin to experience a common consciousness.

The remaining years until the child enters school have been grouped as the first period of individualism, for with the ability to walk and talk comes a new freedom which the child is eager to use. With this eagerness for self-assertion come the first great conflicts with the limitations set by others. The child seems to joy in stubbornness for its own sake and to do things contrary to the will of others just for the satisfaction of his desire for self-assertion. His desire is normal and must not be stifled, neither must it be allowed to go to the other extreme. Perhaps the treatment of the child at this period determines his future in more than one way. Evidently his standard of right and wrong is being established. The easiest standard for the child to set is that those things are right which one is told to do, and those wrong which one is told not to do. Unless the child is given some freedom and is allowed to experience for himself the utility of some types of action, it is difficult to see just how his standard can be higher.

The imagination is particularly strong at this time, and in this scientific age we should not be distressed because the child mind cannot think of love, and good will, and service as abstractions, but believes in personifying them in his world of fairies and spirits. It should not worry us especially that he occasionally gets his world of imagination confused with the world of

reality and tells stories which we call lies, but which are more real to him than the stories he hears adults tell of their every-day experiences.

Since such a large field of experience is opened to the child when he first ventures out as an individual, it is, consequently, a time of important habit formations. A director of a leading school of education has said that more things are determined and more of the disposition of the child set during the pre-school period than could be changed during the whole school experience. Religious education should develop a Christian attitude in the new social contacts of the child and help him to realize that God is father to those outside his own little family circle. With his new self-consciousness must come a realization that other children, as children of God, have equal claims for themselves. It is easy for him to think of God as a Father and of Jesus as a man who loved children, and such a natural belief is the finest that he can have.

The demands for social adjustment due to the entrance into school life mark off the period from about ages six to nine as a period of social imitation.

The very marked characteristics of the period cannot be attributed in any large way to mental growth. The child has again discovered a new world and with his first attainments in school he is overjoyed with the greatness of his accomplishments. He loves self-expression but has temporarily lost much of the disagreeable self-assertiveness of the pre-school period because he feels rather bewildered by the mysteries of his new life. His memory and perception are unreliable, probably because of a lack of such experience as would build up an adequate apperceptive background. He still revels somewhat in imagination and in imitative play, but his world of reality is becoming broader and more absorbing.

Behavior is still largely determined by the immediate results, but the increased number of social contacts and the greater independence from the home give rise to new moral problems. The child has entered upon what might be

called "the justice and legal period", for his standard of conduct is "an eye for an eye". It is very significant that up until the approach of the adolescent period children are more interested in the Old Testament than they are in the New. Tracy estimates that at age eleven, sixty percent prefer these stories.¹ When the child enters school he comes in contact with a variety of children, both good and bad, and must learn to live with them peaceably. There is a real conflict between his own legal code of morals and the more tolerant code which society demands. Religious education has as its purpose to show the child that harmonious and helpful relations with all kinds of children are socially desirable and in accordance with the will of the one common Father.

As the child begins to reel at home in the enlarged society of the school and the wonder at the new wealth of knowledge subsides to some extent, he begins to seek new fields to conquer and enters upon the second and strongest period of individualism. It must be admitted that little effort has been made to understand the child at this age, from nine to the beginning of the period of adolescence. The usual attitude of school teachers has been that about all that could be done during this period was to give a certain amount of memory drill work preparatory to the reasoning efforts of the following period. Such studies as that of Bonser² indicate that reasoning ability is not a faculty that appears mysteriously at the age of twelve years. Furthermore, if there is anything these children do not like it is drill work in which they see no immediate value. Above all else they crave self-expression and continuous action. It is the period of gangs, of making collections, and of a variety of activities which seem to exist solely for their own sake. The child looks for instruction and leadership to those of his own age or to such adult heroes as are interested in those activities, principally physical, in which he is interested. The child is critical and is not easy to teach. He lacks both the

¹ Tracy, Frederick, The Psychology of Adolescence.

²See p.10.

receptiveness of the child of a younger age and the aspiration of the adolescent. His interest in persons and their lives leads to a greater appreciation of the value of personality. As never before, Jesus becomes an ideal, and worship is more thoughtful for being so closely associated with the general respect held for all heroes. The efforts toward religious education at this time are best centered around this respect and devotion to the ideal personality and should include actual training in Christian living.

Tyler says, "Every man is born twice; once at infancy, and again at adolescence."¹ Whether we agree with him or not, it at least seems that the mental changes that accompany the maturation of the physiological functions are the most volcanic of the whole growth process. Whereas the child at nine or ten is an individualist in whose mental make-up there are few evidences of social interest, the interests of the adolescent include the whole world. More than action itself, he enjoys the social approbation that comes from successful action. The altruism of youth is evidenced by an eagerness to go to any extreme for the good of others.

The purpose of education should be to give a sound basis for the expression of the idealism of the period, so that it may not be lost among the realities of adult life. At this period, if ever, social adjustment and the movement from external to internal morality is likely to be completed. It is a time of serious thinking and of emotional extremes. The youth has experiences and does things that are hard even for him to understand. He is often fond of day-dreaming, is moody and thoughtful, although a casual acquaintance may lead one to think otherwise. He is making the effort to bring together all the experiences of the past and the present and the growing interest in the adult life of the future into one complete philosophy which is deep enough to form a foundation for a life program. Forms and creeds,

¹ Tyler, p. 119.

childish prayers and a "Santa Claus God" are no longer sufficient. It is not surprising that perhaps five-sixths of the religious conversions occur between the ages of twelve and twenty. It is to be doubted if there is any reason why the child whose conception of God and whose whole philosophy of life has been growing with his experience and ability to grasp the truth should experience any extreme emotional disturbance in the experience we call conversion, but for everyone there should be a transition from a state of disorganization to a state of organization of life around a single interest system. With the maturity of mind, such an organization of life is possible.

Since the new experiences of this period are many, it is not unusual that it should be a period of mental confusion. It is doubtful if there is a time in life in which the problems to be solved or the adjustment to be made are greater. If the youth makes mistakes and gets off the right path at times, let us not lose faith in him. What will do most to bring him safely through this period, perhaps, is to have such interests as will keep his attention from being centered on himself, and to have some sympathetic and experienced friend to counsel and lead him out to the broadest vision of life. It is unfortunate if during this time when mental and physical maturity is reached and the final preparations for entrance into adult life are made, the youth does not find those friends who can lead him to see life in all its fullness. "What a splendid opportunity for religious education -- the longings, the idealism, the interest in destiny, the capacity for consecrated activity in loyalty to the church of Christ, for new understanding of the worth of the individual human being and hence for a new appreciation of God."¹

C. Disregard of the Growth Factor.

It is evident that the truest and finest religious experience is the result of steady growth and development. What is desired is that the child's

¹Hartshorne, p.155.

religion shall become a personal experience and that his life shall be motivated by a genuine interest and purpose. Such an experience and organization of life cannot be forced. We must not go faster than the child can respond, but must give him all the freedom he can use towards the finest inner development of his neurography according to the Jesus way of life.

G. Stanley Hall says, "Revival sermons which the writer has heard preached to very young children are analogous to exhorting them to imagine themselves married people and inculcating the duties of that relation."¹ The effort to force adult religious views on a child when he cannot appreciate them may result in a feeling of contempt for the whole of religion, in a flippant or irreverent attitude, or in permanent skepticism and doubt. "The religious life must not be regarded as out of relation to the spontaneous life and development of the individual. The early reflexes form the basis of later acquisitions of a righteous character, and it is certainly open to doubt whether the later righteousness can be full and effective except when built upon this basis of reflex."²

¹Hall, G. Stanley, Youth, Its Education, Regimen and Hygiene, p.363.

²Gulick, Luther, The Psychological, Pedagogical and Religious Aspects of Group Games, p.144.

III. VARIATIONS IN MENTAL GROWTH.

A. Differences of Intelligence.

We have been describing what is usually called "the average child", but we are all conscious of the fact that he is the one type of individual who does not exist. With each new experiment which adds to our understanding of human personality, we are reminded again that we are not the same.

Current literature has so much to say about intelligence differences that it is hardly worthwhile to more than illustrate the condition and its relation to moral and religious education. Its importance is best illustrated by the extreme cases.

"We have but to examine our more progressive institutions for the care of the subnormal to see that as far as moral development is concerned, children of so-called inferior intelligence are unable to understand and apply moral and ethical principles in the abstract. They may, according to Goddard, understand concrete situations, but never possess the power to generalize from these experiences and formulate a general principle. As we go higher up this mental scale we find increasing ability to make moral and ethical discriminations and increasing power to generalize from specific examples."¹

In his book on Feeble-mindedness, Goddard states,

"There is no evidence to prove that the feeble-minded person taken in the beginning, understood and properly treated, becomes vicious, bad or dangerous. On the contrary, there is much to prove that he is not vicious; he may be made so by mistreatment, but he is not so naturally. A menace to society? Yes, when mistreated, when not cared for, when allowed or compelled to bear the burdens of intelligent people. But cared for and protected, as all wise parents care for their children, these children need be no more of a menace than other children are. It will be seen that what we have said here is based upon the view that these mental defectives are cases of arrest of development, and they are like normal children of the age at which their arrest takes place; and that our safest guide in the treatment of these cases comes from a consideration of the wise treatment for the normal child of that age."²

Turning now from the matter of subnormals, let us look at an average group of school children and notice the degree of variation. The educational needs of the child are determined by what may be called his moral and religious

¹ Hanson, W. L., Supervision of Religious Education through Objective Tests and Measurements, p.5.

² Goddard, H. H. Feeble-mindedness-Its Causes and Consequences, p.582ff.

age. As was stated on a previous page, this is determined by the child's "potentiality or capacity for mental organization and by the apperceptive background or the material in the form of experience and already existing interest systems which may be used in the formation of a more complete enunciation of philosophy of life." Clearly, these factors are closely related to general intelligence or the "capacity of an individual consciously to adjust his thinking to new requirements."¹ The following table gives the variation in scores, according to the National Intelligence Test, Scale A., made by over 6000 school children in Youngstown, Ohio.² It includes all the children in several buildings, ages eight to thirteen years, grades three to eight. For convenience in making comparisons, red circles are placed in those blocks representing the average scores for each age group.

SCORES		0-4	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75-	80-	85-	90-	95-	100-	105-	110-	115-	120-	125-	130-	135-	140-	145-	150-	155-	160-	165-	170-	175-	180-	185-	190-	195-						
AGE	7.																																														
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"	9	6	24	37	40	46	55	56	64	68	73	66	56	61	62	47	54	47	39	30	23	18	7	8	8	5	4	2	1	1	2																
"	10	5	16	24	32	49	50	66	60	61	57	79	85	79	77	63	62	57	70	82	58	54	54	29	20	16	12	7	2	4																	
"	11	3	6	10	17	19	22	30	28	42	32	47	61	57	47	60	58	90	71	97	87	81	67	59	61	47	31	27	17	19	13	6	3	3	1	2	1										
"	12	2	2	5	17	19	16	16	27	31	19	34	27	40	49	59	62	69	66	81	81	81	83	50	64	43	63	36	27	18	16	9	7	3	5	1											
"	13	1	1	9	4	5	5	16	9	11	13	13	28	30	37	44	34	54	59	51	73	76	67	74	78	87	62	80	50	57	50	28	25	19	5	8	1	1									
"	14																																														
"	15																																														
"	16																																														
"	17																																														

TOTAL NO. CASES = 6714

Pintner, Rudolph, Intelligence Testing, Methods and Results, p.55.

Tested under the direction of Dr. H. H. Young, Director of the Children's Service Bureau, Youngstown, Ohio.

B. Other Mental Differences.

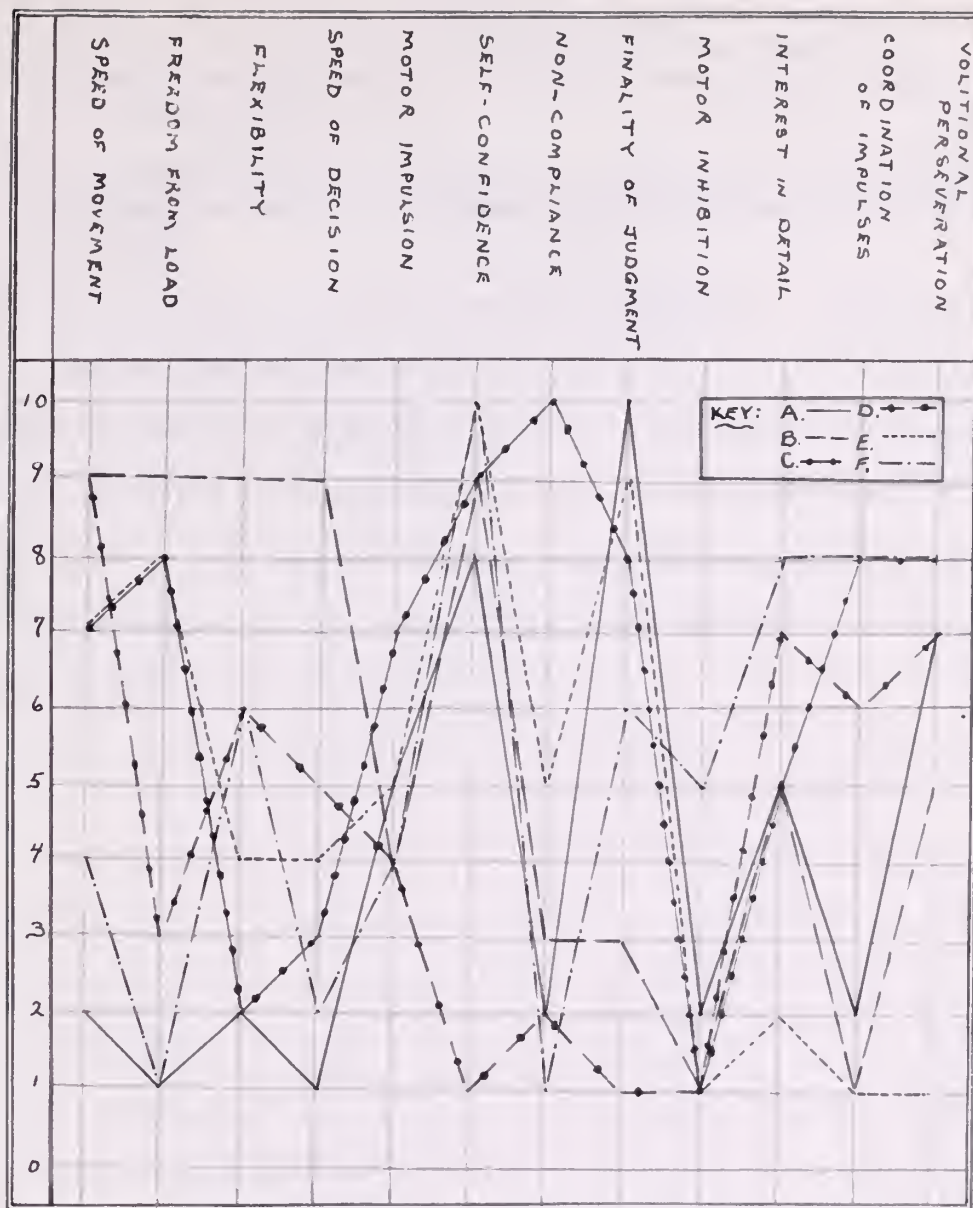
This lack of absolute correlation between mental age and pedagogical age seems to indicate that there are factors in the ability to learn other than those measured by intelligence tests. There are many temperamental traits which must have something to do with the type of religious experience and interpretation, but little has been done to measure them or to estimate their importance. The most extensive studies have been based on the "Will-Temperament Tests" which were originally planned by Miss June E. Downey. Commenting upon her own tests, Miss Downey says,

"Temperament reveals itself in various patterned forms of activity. These patterns are determined by (1) The amount of nervous energy at the disposal of the individual; and (2) the tendency of such nervous energy to discharge immediately into the motor areas that innervate the muscles and glands; or, on the contrary, to find a way out by a roundabout pathway of discharge..... The will-temperament determines the use that will be made of general intelligence, although it does not determine the degree of intelligence. Explosive tendencies which may speed an individual of great ability on to success may ruin a less intelligent man. Inhibitions may nullify genius; they may protect a moron."¹

Using the Will-Temperament Test, A. H. Traxler of the University of Chicago tested 157 students in four Kansas schools. He tried to classify the group of students on the basis of their will-profiles. He was finally able to group all but a few into general types, six of which had rather definite patterns. The following graphs are typical of the six patterns of will-profiles.²

¹Downey, June E., The Will-Temperament and Its Testing, pp. 391.

²Traxler, A. H., A Study of the Will-Temperament of Upper Grade and High School Pupils, p. 209.



The six types may be described as follows:

1. Very low on traits of speed and spontaneity of reaction but tend to score higher on aggressive traits and to do well on the tests for interest in detail and perseverance.
2. High speed and fluidity of reaction. Tendency towards self-confidence and low on traits of carefulness and persistence.
3. Low on all aggressive traits. High on speed of movement and on the traits of carefulness and persistence except motor inhibition. This was a very uncommon type, found especially among freshmen and sophomores in high school.

4. High on all traits of aggressiveness. More irascible than Type 3, but some are lower on non-compliance than the sample. Scores of 8, 9 or 10 on self-confidence and finality of judgment are very common, especially among those of the upper high school grades.
5. Very low on the last four traits, those of carefulness and persistence. Swift of movement, free from load, and self-confident.
6. High on traits of carefulness and persistence. The score on motor inhibition is only 5, but the average is less than 5. Low on speed tests.

Just how important these variations in personality are in relation to religious education it is hard to say until we have additional objective data on which to base our conclusions. That they do have some significance seems very probable, if not directly, at least indirectly as factors determining interest differences.

IV. THE SIGNIFICANCE OF PHYSICAL GROWTH.

A. Physiological Maturity.

The next question we have to answer is in regard to the relationship of physical growth to religious and moral education, or its influence on the capacity of the child to form his neurography in harmony with the Christian philosophy of life.

The first step in the study of this relationship has been to determine some reliable measurement of physiological or anatomical growth or the degree of maturity. The test most used at the present time seems to be the degree of ossification of the carpal bones. Physical growth as measured by the ossification ratio correlates to some degree at least with height, weight, eruption of teeth, the age of pubescence and other measures of maturity.

The results of studies of maturity on various bases have indicated two general conditions: (1) That individuals of the same sex and age vary greatly in the degree of maturity. Boaz¹ judges on the basis of his anthropometrical observations that children may vary in physical development as much as two and one-half years. Woodrow,² judging from ossification radiographs, says that by age ten, children may vary as much as six years. The following table from Crampton³ gives the results of the study of the age of pubescence for 4800 New York high school boys:

Age in Years	Pre-pubescent	Pubescent	Post-pubescent
12.5-13.0	69%	28%	6%
13.0-13.5	55%	28%	18%
13.5-14.0	41%	28%	31%
14.0-14.5	28%	34%	40%
14.5-15.0	16%	24%	60%
15.0-15.5	9%	20%	70%
15.5-16.0	5%	10%	85%
16.0-16.5	2%	4%	95%
16.5-17.0	1%	4%	95%
17.0-17.5	0%	2%	98%
17.5-18.0	0%	0%	100%

¹Boaz, F., "Growth," Cyclopaedia of Education, Vol. III, pp. 187-190.

²Woodrow, Herbert, Brightness and Dullness in Children, p. 107.

³Pedagogical Seminary, Vol. XV, p. 232.

(2) The second general fact is that from the very first year of life the sexes vary in degree of maturity. A table by J. W. Fryor¹ shows the following sex differences in anatomical age as measured by the ossification of wrist bones:

<u>Anatomical equivalent</u>		
<u>Girl's age</u>	<u>Boy's age</u>	<u>Difference</u>
1 yr. 6 mo.	2 yr. 0 mo.	6 mo.
2 " 6 "	3 " 3 "	9 "
3 " 6 "	4 " 3 "	9 "
4 " 3 "	5 " 9 "	12 "
6 " 3 "	7 " 3 "	12 "
7 " 0 "	9 " 0 "	18 "
8 " 0 "	10 " 0 "	18 "
10 " 3 "	12 " 9 "	30 "
12 " 6 "	15 " 0 "	30 "

On the average, girls reach pubescence about two and one-half years earlier than boys.

When we try to determine the significance of these variations in relation to mental growth and the learning process, we approach a debatable subject. In the first place, let us try to determine what relation, if any, exists between physiological maturity and the mental age as determined by intelligence tests. If there is a close relationship between these factors, it is significant, for "It is now considered not enough to group together children who are scholastically alike at the moment; those should be put together who will advance similarly. It is necessary, therefore, that means of predicting probable achievement be assured."² Up to the present time it has not been proven that there is any close correlation between the stage of mental and physical development. A general survey of the work of T. H. Carter

¹See Woodrow, p. 112.

Gates, Arthur I., The Nature and Educational Significance of Physical Status and of Mental, Physiological, Social and Emotional Maturity, p. 354.

and other experimenters in the field is given in an article in the Journal of Educational Psychology for May, 1924.¹ The results of Carter's measurements of carpal bones showed a correlation between mental age and the ossification ratio of only .086. This is less than the correlation between chronological and mental age. Baldwin and Stecher got a coefficient of .09.² Prescott's correlations on four groups were -.05, .12, .50 and .33, but his results were based on selected cases.³ After making a study of a group of students in the Horace Mann School, including the measure of various anatomical traits, physical and physiological functions, together with tests and estimates of emotional stability, social maturity, mental ability and maturity and scholastic achievement, Professor Gates of Columbia University decided that "no physical trait is an adequate index of such types of maturity as mental, scholastic, social, emotional, or 'general' maturity."⁴ It seemed to him that maturity is not a unit trait of general importance. Baldwin and Woodrow seem to stand alone in their belief that the influence of anatomical maturity upon mental growth is of great importance. Woodrow says anatomical age should be used as a correcting factor in mental age, although he recognizes that the correlation is not close enough to warrant its substitution for chronological age in determining the intelligence quotient. He believes that the variation in physical development due to the maturity factor is about three times the variation in mental age. Baldwin says that physiological maturity should be the deciding factor in the advancement of children in school. The reason why they have found higher correlations may be a difference in the methods of measuring maturity. Woodrow did not use any mathematical measure in the study.

¹Freeman, F.M., and Carter, T.M., A New Measure of the Development of the Carpal Bones and Its Relation to Physical and Mental Development.

²Baldwin, B.T., and Stecher, Lorle I., Mental Growth Curve of Normal and Superior Children, Iowa City.

³Prescott, D.A., The Determination of Anatomical Age in School Children, and Its Relation to Mental Development.

⁴Gates, Arthur I., p.351.

of radiographs while Baldwin used the planimeter but neglected the important factor of differences in ultimate size of wrists. Others, especially Carter, have taken this factor into account. As is explained in the article by Freeman and Carter, ossification area consists of the two factors -- final size and stage of development, while mental age involves ultimate brightness and mental precocity. It is evident that there is no high degree of correlation between the stage of physical development and mental age or either of the factors involved in mental age. This does not mean, however, that ultimate size does not correlate with mental age or either of its component factors.

It is interesting to notice at this place the relation of maturity to the personality traits tested by Will-Temperament Tests. Traxler found the ratio of age to the will-temperament score to be $.304 \pm .05$, and its ratio to the score on the Otis Intelligence Test to be only $.267 \pm .05$, from which he judged that "maturity has a slightly greater influence upon the will-temperament traits of these pupils than it does upon their intelligence."¹

B. Other Phases of Physical Growth.

There is ample evidence that mentality correlates with both physical size and motor ability. The following table shows the comparison found between size and physical ability of two groups of school children which represent the extremes of mentality.² Several other experiments with different groups have seemed to indicate that this correlation is common for all ages and types of individuals.

¹Traxler, A.E., p.279.

²Heaton, K. L., "Physical Development of Children of High and Low Mental Ability Groups," American Physical Education Review, vol.XXX, pp.127-130.

TABLE OF AVERAGE SCORES

-BOYS-

AGE	MENTAL AGE	NO. OF CASES	HEIGHT IN INCHES	WEIGHT IN LBS.	CASES WEIGHT NORMAL	WEIGHT BELOW NORMAL	75 YD. DASH-TIME IN SEC.	CHEST EXPANSION IN INCHES	PUSH UP	RUNNING BROAD JUMP DISTANCE IN FEET
11 YEARS	HIGH	11	55.84	77.02	6	5	11.18	2.18	33.53	9.84
	LOW	24	55.88	68.81	10	14	13.74	1.92	18.00	7.42
12 YEARS	HIGH	16	58.05	96.28	12	4	11.48	2.46	34.88	10.40
	LOW	21	57.82	83.03	7	14	13.29	2.01	17.05	8.92
13 YEARS	HIGH	19	59.89	104.54	12	7	11.38	2.72	30.49	10.85
	LOW	11	59.14	92.23	3	8	12.69	2.51	12.18	9.82

-GIRLS-

AGE	MENTAL AGE	NO. OF CASES	HEIGHT IN INCHES	WEIGHT IN LBS.	CASES WEIGHT NORMAL	WEIGHT BELOW NORMAL	75 YD. DASH-TIME IN SEC.	CHEST EXPANSION IN INCHES	PUSH UP	BASEBALL THROW DISTANCE IN FEET
11 YEARS	HIGH	13	56.10	83.78	5	8	12.30	1.94	30.23	53.94
	LOW	11	56.09	76.27	3	8	13.75	1.86	14.36	50.02
12 YEARS	HIGH	16	60.27	97.69	7	9	12.96	2.07	24.56	51.14
	LOW	16	58.25	90.95	9	7	14.47	1.67	16.25	48.06
13 YEARS	HIGH	22	61.95	111.92	12	10	13.10	2.36	23.28	55.93
	LOW	15	60.17	86.45	3	12	13.27	1.80	17.40	54.31

It is hard to say just what direct effect this condition has on moral and religious education. Waddell says, "It is not denied by anyone that both defects causing weakness and those causing irritation are factors in the causation of delinquency, but there has been a tendency to overestimate their significance."¹ Among the extremely defective it is evidently a positive factor for delinquency and an immoral attitude. If fatigue and sickness influence the emotional control, the intensity of purpose and the general outlook on life of the normal individual, it is to be expected that a continuous subnormal condition of strength and vitality would not be conducive to the finest growth in moral and religious purpose. "Every bodily defect or disturbance is a handicap to mental and moral development. Sluggish organic functioning, physical depression, disease and dissipation are serious obstacles to a high standard of ethical living, rendering such practically impossible in the vast majority of cases. In the improvement of the physical condition of the individual is to be found (sometimes at least) the first step in the natural and logical method of developing his character and moral sense."²

¹Waddell, C. L., Introduction to Child Psychology, p.242.

²McCutcheon, J. M., The Relation of Physical Education to Moral Development, p.14.

V. INTEREST DIFFERENCES.

A. Physical and Mental Basis.

All the effects of physical and mental growth on educational procedure may not be direct. It is with this in mind that we turn to the matter of interest differences to determine whether or not they have a physical and mental basis. Garnett says that interest in a certain thing depends upon the amount of associations with it or the number of thought streams which drain into the neural arc related to this interest..... No one ever took an interest in any object about which he had not a goodly number of ideas, nor did any one ever have any ideas about (or associated with any of his thoughts of) an object in which he did not take an interest."¹

The very fact that the interests of children are continually changing with age and that there are so many interests common to all children, seems to indicate that they are dependent upon the stage of physical and mental development. There are, also, very great variations of interest between different children. Seashore gives an example of the importance of individual differences in discussing motility or spontaneity of action. He says, "It is extremely interesting to interpret the work and play of the child in such terms, noticing how this fact of slow, average, or quick motility not only accounts, in large part, for his achievements in work and play, but also serves as a key to his interests, his ambitions, and in many respects to his feelings and sentiments with reference to his environment."² It is evident that a child could have no interest in any instruction or the activities of any group which made demands on his intellect which were above his level of mental potentiality. It is also to be expected that no child could have a great deal of enthusiasm about any type of physical activity from which he was not able to secure at least a minimum amount of satisfaction. This is at least one important reason why people tend to center their lives on one or a few related types of activity

¹ Garnett, p.63.

² Seashore, C.E., The Psychology of Musical Talent, p.173.

and to lack interest in other phases of life outside their narrow field.

B. Interest Differences in Relation to Symmetrical Development.

The question confronts us in regard to the child as to the extent to which his desires and interests should be satisfied. Tyler says, "The child is naturally successively animal, anthropoid, half-barbarian and then civilized."¹ He felt that we could not eliminate one of these stages and secure full normal development. The child's interests are predominantly in physical activities because his greatest need during childhood is for physical growth. Gradually his interests are shifted from the physical to the mental. For this reason, it is being advocated as more profitable to give religious and moral instruction through play activities than in classes of formal instruction. The Cleveland² Recreation Survey showed that the average child spent one thousand hours a year in school and eighteen hundred hours playing on the streets, in the parks and elsewhere. The alarming thing was that there was no evidence that the instruction received during the thousand hours was influential in determining conduct during the other eighteen hundred. "Those who have had experience in half-time schools report that young children learn almost or quite as much during half a day as during a whole one. The introduction of outdoor and manual work in our truant and industrial schools has not diminished the amount of knowledge acquired, but rather increased it."² Furthermore, it is possible that the child who is forced to study too much during early childhood contrary to his predominant interests may suffer in later life from the inability to concentrate his interest on any study. All things are learned through mental or physical activity, and the younger the child, the more it must be through physical activity.

It is true that as the child approaches youth and adulthood, his interests must be modified to correspond with the goal of society. It is also true that

¹ Tyler, p. 53

² Ibid, p. 212.

as each makes preparation to contribute his best towards the realization of the ideal of the kingdom of God, over-indulgence of interests may hinder the development of the most useful life, whose perfection must lie in its symmetrical development. Nevertheless, the growth in power of an individual life is encouraged, not by neglecting the basic differences of physical and mental endowment, but by their utilization in determining the particular opportunities of each individual and in preparing him for his place in society.

C. Education through Association in Play Life.

There is a growing belief in the possibilities of religious education through play and other leisure time activities. Many churches, schools and communities have introduced recreation activities, principally for the character values received from such programs. The great good which has actually come from such work is due in part to the activities themselves, but largely close friendships that are formed with the young people through this work. Such cases are examples of what James has in mind when he mentions the fact that a thought-activity sometimes "takes the initiative and draws our attention to itself, not by reason of its own intrinsic interest, but because it is connected with some other interesting thing."¹ It has often been noticed that the majority of workers with young people seem to make such helpful contacts with only one or a few types of individuals. If their program is one of physical education and athletics, they draw the community athletes; if their predominant interest is musical, they are likely to be quite popular with musicians while few others may really get to know them. Thus, the breadth of one's influence is dependent upon the variety of his types of contacts. Let us ask a question which will suggest its own answer: If we rely on the power of personality in association with the daily life of a boy

¹Garnett, p.10.

or girl to lead him to a full moral and religious life, is it not necessary that we understand the physical and mental characteristics of the child before we can cultivate the types of association through which personality can best be expressed?

D. Types of Religious Experience.

Is it not possible, also, that personality traits may do much to determine the actual type of religious experience? It is being realized that the religious life of boys tends to be somewhat different from that of girls. It is explained by the fundamental differences in temperament. "Man is made for the discharge of energy at a higher rate for a short time, he is the katabolic element, while woman stores up energy for her children and represents the anabolic element of the race."¹ Discussing games and athletics in relation to pedagogy and religion, Luther Gulick says that the church has not succeeded in attracting boys because they have not seen that religion satisfied a real need in their lives. Formerly religion has been considered as a state rather than a progression, as anabolic rather than katabolic, as entirely subjective--almost selfishly so. For the boy "the religious life must be energetic and enthusiastic, and executive; he must do things, he must do hard things, he must do heroic things..... The church has not put emphasis upon those qualities that represent the best and noblest side of young men..... The qualities demanded by her are chiefly anabolic and subjective. These are feminine, not masculine in composition."²

These differences are not all sex differences. As Thorndike³ says, discussing the influence of sex on individual differences, there is great overlapping in the traits of the sexes and the differences are in most cases of degree rather than of type. The average of one sex varies from the average of

¹Myerson, A., The Foundations of Personality, p.295.

²Gulick, pp.145,147.

³Thorndike, L.L., Individuality, pp.29-33.

the other sex much less than many men (or many women) differ one from the other.

Perhaps it is because of the changes that occur with growth, and our failure to recognize them in their relation to the type of religious interpretation demanded, that many children gradually lose interest in the church. It is significant that at that age when the most religious conversions occur and when the child is most interest in religion, many quit going to church and to Sunday school. This loss of interest by the youth in the activities of his childhood is not restricted to religion. It is the period at which the public schools have difficulty keeping them in school. Grouping adolescents together and teaching them in accordance with their needs and desires is actually conducive to greater interest and success in any type of instruction. In a New York high school, 295 freshmen boys were divided into classes according to the degree of physiological development. At the end of six months twenty per cent. had left school, twenty per cent. had failed in at least one subject, and sixty per cent. had passed in their studies. One hundred forty-nine boys of the same degree of maturity were placed in classes on the basis of the schools previously attended, without regard for the degree of maturity. At the end of six months thirty-one per cent. of these had quit school, seventeen per cent. had failed, and only fifty-two per cent. had passed.¹ This only illustrates one way in which education may profit from recognizing the interests and needs of different individuals.

The world and its needs may be the same, and God's broad personality may remain constant, but our response to both is determined by our own capacities, needs and interests. We do not all feel the call to the same places of service in the world, but all must feel the challenge of world-citizenship. "It is unnecessary to aspire to the ecstasy of the mystic, but to miss the sheer joy of personal contact with an omnipotent and affectionate

¹King, Irving, The High School Age, p.40

God is to fail to feel the most profound and thrilling sensations of delight that living man is capable of enjoying."¹

¹Champlin, C.D., A Philosophy of Moral Education for Students, p.598.

SUMMARY.

I. From a study of the laws of thought it is seen that the purpose of moral and religious education, as well as of all other education, is to organize the neural systems of the individual mind about some central life purpose which is in harmony with that of the other members of society and with the sum total of truth.

II. Moral and religious development for any individual is a growth process which parallels other phases of mental development. Therefore, it is necessary to understand the mental potentialities and experience of the child from year to year if he is to receive the most from any effort toward education. Not only is it evident that the truest and finest religious experience is the result of steady growth, but there is actual danger that the effort to force too advanced views of religion and morals may permanently injure the child's attitude toward life.

III. There are among children of the same age significant mental differences, both of intelligence and other personality traits, which make it impossible to treat all those alike who are of the same chronological age or even those on the same level of scholastic attainment.

IV. Evidence does not support the belief that there is any close correlation existing between physiological maturity and either ultimate brightness or mental precocity. There is evidence, though, that the relative physical size, strength and vitality correlate very closely with mental ability. This condition, in extreme cases at least, has a significant influence on the general attitude toward life, and hence on moral and religious education.

V. Physical and mental growth have an important indirect influence on the education process as determiners of interest differences. These interest differences are keys to the educational needs of the child, have an influence on the type of educational leadership and procedure that is effective, and do

much to actually determine the type of moral response and religious experience of the individual.

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* Note: Except in the case of those references for which a page or chapter notation is given, indicated in the bibliography with an asterik (*), all the references listed in this bibliography were read in their entirety in the preparation of the dissertation. In a few cases the whole reference did not justify careful reading, in which case the less valuable sections were only read with sufficient care to gain the material they had to contribute.

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